Impaired Waters Restoration Working Group
Report for Governor's Water Summit
12/9/03

Our Work Group Assignment

Governor Vilsack asked the Impaired Waters Restoration Work Group to develop consensus recommendations on strategies for improving Iowa's water quality. The strategies identified in this report will help restore waters on Iowa's Impaired Waters List and reduce the probability that additional waters will need to be added to future impaired waters lists. The following eight topics where assigned to this work group as a starting place for our discussion.

Impaired Waters Restoration Work Group Topics

- TMDL process improvement
- Implementation of TMDL plans (roles & responsibilities)
- Establishing priorities among impaired waters
- Impaired waters listing and delisting processes (303d and 305b)
- Water monitoring results and needs
- Habitat degradation and restoration
- Hydrologic alteration and restoration
- Dredging (and related "in-lake" remediation)

About this Working Group's Process

The Impaired Waters Restoration Working Group was given the charge of shaping recommendations around the above eight topics – ranging from the encompassing "priorities among impaired waters" to the technically specific "dredging." You will not find these topics as specific section headings in this report. That does not mean this working group has not given due consideration to the assigned topics. It has. Days were set aside for presentations around these topics with representatives from agencies and academia providing rich, in-depth background.

The Impaired Waters Restoration Working Group has incorporated our findings into a report that tackles enhanced water quality in the state of Iowa with a series of five goals:

Impaired Waters Restoration Work Group Goals

1. Build Commitment and Demonstrate Success
2. Improve Water Quality Assessment
3. Improve Water Quality Restoration
4. Target Research and Enhance Expertise
5. Invest in Clean Water

These goals envelope the eight topics that were initially assigned to this work group, but in some cases go beyond the specific charge to our group. This was done to round out our

recommendations in areas we believe are essential in order to have a substantive impact on water quality in this state. This document elaborates on the meaning of these goals and outlines the recommendations – the structures, processes, and/or programs it will take – to achieve success.

Guiding Principles

The guiding principles that have shaped our work group decisions and recommendations include:

- Voluntary changes promote buy-in, prevention, lasting progress, and pride in success
- The focus of water quality restoration should be on prevention – on proactively enhancing water quality through collaboration and partnerships, and not through finger-pointing
- Prioritization of watersheds for restoration and enhancement should include both impaired waters and protection of high quality waters
- Water quality restoration should be seen as a process to improve the condition of aquatic resources, not simply as compliance with a legal requirement.
- Water quality restoration is an investment in our future, not a cost without return
- Watershed work is ongoing and requires consistent, sustained resources
- Water quality improvement plans should be implemented at the watershed level
- For successful implementation of restoration plans, all local stakeholders need to have the opportunity to become fully engaged in setting goals and implementing watershed improvements
- Local stakeholders must be willing to invest local resources to enhance water quality
- Research should be targeted to fill critical information needs
- Collaboration and coordination in water quality research is essential
- Model projects are a valuable research tool
- The TMDL process should be implemented in a way that promotes collaboration
- Because resources are limited, resources should be targeted to be cost effective and maximize benefits for improved water quality
- Enhancing water quality is a big challenge that will require significant changes - new approaches, new practices, and new determination
- To be successful, Iowans must believe we can improve water quality and be willing to move forward before every question is answered – common sense should be our guide

Goals and Implementation Strategies

Goal 1. Build Commitment and Demonstrate Success

Build local capacity and buy-in to support restoration and enhancement activities within Iowa's watersheds and use pilot projects to demonstrate success.

Rationale: Successful efforts to restore and enhance Iowa's water resources are dependent upon committed and capable local citizens working within the watershed and a watershed governing structure. Buy-in and "ownership" of the watershed, existing limitations of the water resource, and watershed restoration and enhancement activities must be embraced by residents and landowners of the watershed to achieve success. Leadership of restoration and enhancement efforts needs to come from residents and landowners of the watershed. Local actions should be driven by "wanting to achieve success", rather than regulatory or other forces from those outside the watershed.

Implementation Steps:

A. Facilitate the establishment of Watershed Districts. Encourage the creation, operation, and support of watershed districts throughout Iowa to work with County Soil and Water Conservation Districts (SWCDs) and other local city and county officials to address water resource issues along watershed boundaries. Creation of watershed districts will result in more public awareness of watershed issues and more local involvement and interest in water quality improvement to benefit their community. The focus of these districts is to coordinate watershed planning efforts (especially where watersheds cross political boundaries), provide a stable funding base for ongoing watershed work, and provide a legal authority for the long term maintenance of water management structures for flood control, sediment basins or wetlands installed for water quality improvement purposes.

B. Develop watershed governance. Develop Watershed Councils or other governance within watershed districts with the authority to raise money and to set watershed goals and direct efforts, structured to work integrally with existing Soil and Water Conservation Districts (SWCDs). Watershed Councils should include local government, agricultural producers, businesses, conservation groups, and others citizens to provide local forums for public education and participation in watershed management planning.

C. Develop local leadership. Provide educational outreach to equip local residents to understand their watershed and the water quality enhancements needed, and provide program support to assist in achieving local watershed goals. Provide local "capacity-building" training to equip local residents to provide needed leadership in their watershed. Provide organizational checklists and other assistance to improve organizational efficiency. Facilitate networking with other successful watershed projects and use success stories as an educational and training tool.

D. Empower local watershed leadership in state and federal assistance programs. State and federal assistance programs should be structured to provide a greater role for local watershed leadership in the implementation of voluntary water quality improvement plans. Flexibility should be allowed within these programs to meet local objectives, while retaining needed program structure.

E. Establish an "Iowa Beacon Watershed" program. Pilot projects can be used to document the types of improvements in water quality that can result from focused community efforts on improved management of land and water resources. Establish a watershed pilot program to provide water quality improvement success stories in each region of the state. These watersheds should be small (at most 3rd order streams), so that effects of management changes can be seen most rapidly. The projects should be regionally located to highlight the differences in watersheds and demonstrate how these differences can best be addressed locally. Focus additional state- or EPA-funded research on land management, water quality, and hydrologic research in these watersheds. Establish new "Beacon" watersheds as progress is made in existing pilots, utilizing and building on the knowledge gained in the initial projects.

F. Link K-12 education directly to water quality. Fund a Conservation Education Consultant position within the Iowa Department of Education to develop resources through grants and partnerships, and to coordinate efforts across the state related to K-12 education on water quality conservation issues. It is important that this consultant collaborate with local, state, and federal agencies as well as agricultural, conservation, and other non-profit organizations in developing the teaching materials to ensure that it is balanced and accurate. This position would ensure these educational pieces stress personal responsibility and sound science, with an emphasis on local water quality issues.

Goal 2. Improve Water Quality Assessment

Maintain and strengthen the ongoing water quality monitoring and assessment processes to improve goal setting, restoration work, and the documentation of water quality trends.

Rationale: An objective method of determining the relative health of waterbodies should be the cornerstone of a water quality improvement process. Water quality monitoring and assessment provide that objective approach.

Implementation Steps:

A. Maintain and strengthen Iowa's ongoing monitoring program. In order to improve water quality it is necessary to maintain and strengthen water quality monitoring efforts to ensure the development of a long-term water quality database for Iowa. The ongoing monitoring program should include all water resources in the state - lakes, impoundments, rivers, streams and wetlands. To assure recognition and restoration of impaired waters, the monitoring program must be broad enough to identify waters requiring restoration, detailed enough to diagnose the problems leading to poor water quality, and continuous enough to assess and document water quality trends – whether improving or declining.

- The existing water quality monitoring technical advisory committee should be reconvened to plan an ongoing monitoring program.
- Monitoring the quality of flowing water should be augmented with flow measurements where possible.
- Iowa citizens should be encouraged to participate in monitoring efforts in ways that are appropriate to rigorous assessment.

B. Improve Iowa's Water Quality Standards. Water quality standards (WQS) are the yardstick used to measure water quality. If monitoring and assessment are the cornerstone, WQS are the foundation of a good water quality improvement program. Rather than being static, WQS should constantly be reviewed and improved. Inadequate WQS lead to poor restoration plans (e.g. TMDLs) or attempting to correct problems that may not exist. On the other hand, lack of appropriate water quality standards may result in failure to identify serious water quality problems, delaying restoration efforts while the problems worsen.

- Establishing water quality standards for sediment and nutrients should be a top priority
- Iowa's existing Water quality standards and designated use designations should be improved to provide differentiation between types of lakes (e.g., natural glacial lake versus flood-control reservoir) and wetlands as well as a differentiation for drainage ditches.
- Water quality standards, including those that will fulfill EPA's mandate for nutrient numerical standards, need to be based on sound science, need to consider historical monitoring data, and be realistic and technically achievable.

C. Integrate human health-related measures into monitoring programs. Bacteria, other disease-causing organisms, blue-green algae, pesticides, pharmaceuticals, and toxins in fish tissue all represent water quality impairments that could influence human health. Public health agencies including the Iowa Department of Public Health and County Sanitarians should become active players in assessing and monitoring potential and actual health effects of water quality.

D. Monitor and assess sediment and nutrient impairments. Most water quality experts agree that sediment and nutrients are the two most common water quality problems in the state. We need improved monitoring and assessment processes for nutrient and sediment impacts and establishment of criteria for listing waterbodies with these impairments.

E. Develop TMDL-specific monitoring. Additional monitoring data is needed to diagnose problems and develop effective restoration plans (TMDLs). Determining pollutant stressors, calibrating and verifying water quality models, and documenting post-TMDL successes or failures are all critical monitoring needs.

F. Establish a monitoring program for waters with "suspected" impairments. For a number of waters, impairment is suspected but credible data are lacking. A monitoring program must be developed for these waters to assess their water quality. Waters that serve as a source of drinking water should by given a high priority for this impairment verification monitoring. Such a monitoring program should be above and beyond the current level of effort for the ambient monitoring program.

Goals 3. Improve Water Quality Restoration

When water quality problems are identified, restoration plans are needed to restore water quality so that impaired waters will again support their designated uses.

Rationale: If our goal is improved water quality then we cannot stop with improved monitoring and assessment. When water quality problems are identified, we must take the next step to develop plans to restore these waters so they will again meet water quality standards and support all of their uses for drinking water, recreation, and aquatic life. Waters that are impaired because of a pollutant such as bacteria or nitrate are required to have a restoration plan (called a TMDL plan). Other types of impairment such as habitat alteration or hydrologic modification do not require TMDL plans, but alternative restoration plans can be developed to address these impacts.

Implementation Steps:

A. Develop a public education and involvement plan around the impaired waters listing process. The impaired waters listing process needs public understanding to garner support for restoration. Trained educators and facilitators should be tapped to work through a pre-designed but flexible process to develop local/public understanding of water quality issues, impairments, and achievable solutions. A consortium of educators, state agency personnel, ISU Extension, local watershed coordinators, and public involvement experts could be convened to shape a basic framework for this education/facilitation. The process, however, would necessarily be tailored at the local level to individual communities.

B. Seek consistency in listing and delisting decisions. Significant changes in the policies surrounding the listing and delisting of waters have resulted in major changes in Iowa's impaired waters list in recent years. For the list to have credibility with the public and to be effective in targeting resources for restoration, listing and delisting decisions need to be based on sound, objective methodology consistently applied to avoid big variations in lists from one listing cycle to the next. Waters should be placed on impaired lists if an impairment is documented. They should not be removed from lists until there is substantial evidence of real water quality improvement, there is a change in the designated uses or water quality standards that eliminates the impairment, or existing data does not support updated listing requirements.

C. Separate roles and responsibilities in the watershed restoration process. In the current process of water and watershed restoration (i.e., TMDL), the identification of impairments, public education, diagnosis of problems, feasibility and choice of restoration alternatives, watershed restoration and the assessment of success are all performed by the same agency with little independent input. The separation and sharing of roles and responsibilities to ensure quality and consistency is a fundamental tenet of good quality assurance and quality control (e.g., ISO 9001-9003). Separation of roles and the sharing of quality assurance should become part of the water and watershed restoration process. The assessment and restoration process should be shared among organizations, agencies and citizens that can most effectively accomplish water quality assessment and improvement.

D. Broaden Stakeholder Group to Complete Restoration. It is likely that no assessment or planning process – even at the local level – will engage all the players that need to be involved with restoration, without a concerted effort to draw in a broader audience. The expertise of local watershed leaders should be utilized to include as early as possible all landowners and other stakeholders in the watershed that may be helpful in implementing the restoration plan.

E. Establish achievable restoration goals. Water quality restoration goals need to be realistic and achievable and take into consideration natural conditions that may limit water quality. To be successful, restoration goals must also have the support of local stakeholders for implementation to be successful. Watershed restoration plans (TMDLs) should be developed with input and involvement of local stakeholders.

F. Adopt a holistic approach to watershed restoration. The goal of the TMDL process should be to provide stimulus for the citizens in the watershed to voluntarily embrace a holistic approach to improving attitudes and practices that will result in long term enhanced water quality. While a particular pollutant may trigger the requirement for a TMDL plan, a holistic watershed restoration plan will address all water quality concerns. If it comes to a choice between quality and quantity, a fewer number of holistic watershed plans will provide more water quality benefits then a larger number of plans addressing only the listed pollutant.

G. Target restoration efforts. Geographic Information Systems (GIS), modeling and other methods of determining the most critical areas of a watershed should be employed to help pinpoint where improved management practices could be most beneficial. Limited resources can then be more effectively targeted to encourage land use changes that will provide the maximum water quality benefit.

H. Prioritize waters for restoration. Although all waters in the state could be improved, we also need to target limited resources to waterbodies most in need of improvement. These targeted resources should include priority water resources, including drinking water sources, important recreational areas, and critical habitat areas.

I. Coordinate water resource programs. The federal Clean Water Act requires all states to develop and implement a continuous planning process (CPP) to direct water resource programs. Iowa's CPP should be updated and utilized to more effectively coordinate staff and funds allocated to water resource protection and improvement programs. A coordinated approach would provide improved efficiency in problem identification, watershed planning, and implementation of restoration plans. This coordination should be achieved under the guidance of a statewide advisory committee comprised of representatives from a range of public and private interests and expertise. The state should encourage federal agencies to participate in this advisory committee and wherever possible to utilize their staff and funds in a manner consistent with the priorities set by this coordinated effort.

Goal 4. Target Research and Enhance Expertise.

Strengthen the quality, collaboration, and consistency of ongoing technical input in all phases of watershed work in order to improve our ability to diagnose water quality problems and provide expertise and technology transfer to local watershed groups and landowners.

Rationale: Eliminating impaired waters and improving overall water quality requires a watershed approach. Whether based on a TMDL or other watershed improvement process, it is imperative that the identified watershed strategies are technically robust and have the

consensus of water quality experts. Not only is this needed to maximize scarce resources, it is needed to get buy in of all stakeholders in the watershed. Unfortunately, there are critical gaps in our current knowledge. In addition, water quality research is often fragmented and driven by short term funding opportunities rather than long term research needs. Unless these knowledge gaps are addressed, limited resources may be wasted on ineffective control strategies.

Implementation Steps:

A. Provide Watershed Technical Advisors. Provide state funding for new positions (e.g. DNR / IDALS / ISU Extension joint appointments) that are dedicated to working with local watershed groups. These watershed technologists could provide GIS-based watershed analyses, interpret local water quality trends, and encourage community-based watershed management through activities such as workshops, volunteer monitoring, stream corridor assessments, and working with landowners to demonstrate alternative management practices in riparian corridors and on agricultural lands. Support these positions with GIS and data-management expertise with DNR-IDALS, and give them access and input to establishing research agendas.

B. Enhance technical and stakeholder participation to provide consensus agreement on TMDL approaches. The Department's TMDL program originally formed two ad-hoc committees to receive input and comments on the TMDL process: a Stakeholders Group and a more directed Technical Advisory Committee (TMDL TAC) comprised of water quality experts. The TMDL TAC should be re-convened on a regular basis (at least twice per year) to review proposed approaches to TMDL calculations to insure that selected technical approaches, such as the use of a particular water quality model and inherent assumptions, are appropriate to the problem being addressed. The TMDL Stakeholders group should continue to meet on a quarterly basis, or more frequently when needed.

C. Provide an enhanced level of GIS support/training for the development and implementation of watershed projects. A GIS-based approach to watershed work to restore impaired waters or improve non-impaired waters is a cost effective way to analyze a watershed and target restoration/improvement activities. The Department of Natural Resources has provided some GIS assistance to local watershed projects, but an enhanced level of effort is needed to provide assistance and train local watershed staff in the use of GIS.

D. Establish a watershed coordinator training/certification program. The success of watershed projects is closely linked to effective leadership. A watershed training/ certification program could provide more effective watershed leadership and be done either as part of university coursework (e.g., as a specialty within a major curriculum), or as a non-degreed certification program. Trained watershed coordinators are needed to build and maintain support among the stakeholders and to insure that the best technical advice is used to solve problems, bridging the gap between local capabilities and perceptions and current research and technology.

E. Create and maintain information systems to consolidate and summarize watershed and water quality data. The base of technical information on Iowa waters and watersheds is growing but the coherence and coordination of this knowledge base could be improved.

Efforts such as DNR's online Watershed Atlas, ISU-DNR's Iowa Rivers Information System, and ISU-DNR's Lake Information System should be enhanced, expanded and linked to make sure that we avoid being information-rich but knowledge-poor. Concerted efforts should be made to share information among agencies and coordinate information collection at all levels. Data and information should be easily accessible by agencies, scientists, policy makers and citizens. Water quality information systems should relate data to established standards and criteria and should avoid agency- or program-specific jargon [e.g., TMDL, 303(d), 305(b)].

F. Conduct Nutrient Research on a watershed scale. We need better information on the various sources of nutrients and how management practices affect the fate and transport of nutrients on a watershed scale. This research is essential to fine-tune and target our water quality restoration efforts to achieve results of reduced nutrient loads to our state waters.

G. Develop a water resource research agenda for Iowa. Establish an ongoing advisory committee comprised of local, state, and federal agencies; private businesses; colleges and universities; and others involved in water resource management to develop an Iowa water resources research agenda to guide research efforts. This agenda will help assure that water resource research in Iowa will be coordinated and strategies for information sharing devised to eliminate overlaps and fill in gaps.

H. Establish a water quality research institute. Invigorate hydrologic and water quality research by funding a full-time university research position dedicated to an independent research body such as the Iowa State Water Resource Research Institute (ISWRRI). Focus the role of this position to identify funding sources for research efforts and link research activities with the information needs of local watershed groups, by working collaboratively with researchers, state and federal agencies, and local or regional watershed experts.

I. Examine links between agriculture and communities. Conduct economic and social research on the ties between agriculture and communities – both urban and rural -- to establish links between our agricultural vitality and the vitality of our communities and watersheds.

J. Develop urban and rural watershed-scale research that addresses hydrologic changes and habitat impacts. Aquatic habitats are sensitive to a number of factors including flow regime, water quality (particularly sediment), and conditions of streambeds, stream banks, and nearby riparian vegetation. The high degree of alteration of Iowa's rural landscape began over a century ago as part of a deliberate strategy supported by state and federal policy to facilitate economic and social development. Our urban landscapes have also been dramatically changed, and urbanization can lead to even greater hydrological impacts. We need a broad range of research efforts to tell us how to minimize the impacts of Iowa's altered landscape without significantly impacting the positive benefits. If we can discover ways, for example, to just slow water down, we could have a strong positive impact on water quality.

Goal 5: Invest in Clean Water

Identify new resources and target these resources to effectively achieve watershed restoration, water quality enhancement, and pollution prevention goals.

Rationale: The current level of financial commitment is not adequate to solve our water quality problems and even "dedicated" funds set up for water quality work are frequently raided to help fund other priorities. Adequate local, state and federal funding resources are needed to achieve success in watershed restoration and water quality enhancement activities. Financial assistance to facilitate and support voluntary actions by watershed landowners and residents are critical to watershed restoration and enhancement. Technical resources are also needed from local, state, federal and private sources to achieve success.

Implementation Steps:

A. Recognize restoration, enhancement, and prevention as an investment, not a cost. Conduct assessment and monitoring of the social and economic benefits of water quality restoration to demonstrate to the public and policy makers that restoration expenditures bring social and economic returns far exceeding the costs.

B. Return money raided from dedicated funds. Money from dedicated funds such as the groundwater protection fund and the underground storage tank fund that was used to help fill budget shortfalls during the recent economic downturn should be returned as soon as possible to fund the water quality work for which the fees were collected.

C. Increase state and federal assistance funding. Establish the level of funding resources needed to provide financial assistance to achieve voluntary actions by landowners to accomplish restoration of all impaired waters. Establish additional funding resources to facilitate watershed enhancement above and beyond identified impaired waters in order to prevent impairments from occurring.

D. Establish consistent funding sources. Establish a stable statewide funding source from product sales, fees, sales tax, etc. to a constitutionally protected trust fund(s) to insulate watershed restoration and enhancement efforts from cyclical economic and budget shortfalls.

E. Use drinking water sales tax to fund water quality work. Use the $13 million in sales tax currently collected from public drinking water customers as a dedicated fund for water quality work. This money could be used as a source of grants for local watershed councils for development and implementation of watershed restoration plans and education and outreach activities with communities and schools.

F. Establish authority for tax referendums on a local watershed basis. Enact statutory authority for local citizens to decide by referendum to establish a local income tax surcharge on a watershed area basis, similar to that for Iowa school districts, to provide a consistent base of funding for watershed restoration and enhancement work. Base level funding will then serve as leverage from which to attract resources from state, federal and private sources.

G. Maximize effectiveness of expenditures. Target the expenditure of financial assistance to those practices and activities that will provide the greatest restoration and enhancement of the affected water resource. In some cases watershed models can be used to help target land and water restoration work to get more value from the public and private investment.

H. Increase human resources. Increase the human resources to get the work done by adding staff to DNR, IDALS, and ISU Extension and also using local technical experts, contractors, and volunteers.

I. Reward good practices and prevent problems. Prevention of impairment is more cost effective than remediation after the impairment has occurred. The high cost of dredging sediment from a lake or reservoir is just one example of the price we pay for not having invested in good soil erosion control practices in the watershed. We need to compensate landowners doing good things to help keep those good practices on the land as well as pay incentives for landowners willing to change practices to improve water quality.

Educational Needs

- Build local ownership and pride in watersheds through erecting signage on state and federal highways identifying their "watershed area". We could also include a map of Iowa's 8-digit watersheds on the Iowa DOT road map. Another method to build watershed identification would be to have stickers that can be placed on license plates that identify the "home watershed" of the vehicle's owner.
- Identify models for successful watershed projects using experience in Iowa projects, and successful models in other states and worldwide. A conference featuring presenters from successful watershed projects should be organized and offered to the public.
- Inform Iowa citizens about the need for ongoing water monitoring to ensure the quality of this strategic natural resource.
    - Involve agency personnel in the crafting and reassessment of monitoring programs
    - Out-source monitoring to educational institutions, where possible, to ensure the on-going training of highly qualified water personnel in Iowa
    - Establish an on-line data source where agencies and the public can view updated water quality information in relation to established standards and criteria
    - Develop an understanding of the dynamic relationships between water quality and hydrologic flows so that mass losses (and costs) can be calculated, and so that actual changes in water quality can be identified with greater confidence.
- Publish a more public-friendly summary of the water assessment report [305(b) report] including information on impaired waters [303(d) list] for use by the public and policy makers. The report should be organized by watershed with watershed maps and summary charts with water quality assessment information provided for each 8-digit watershed (The summary report in Illinois may be a good model). When new assessment reports are submitted to EPA, the residents and landowners in watersheds

of impaired waters or waters that are threatened with impairment should receive notification of the pollutants of concern either through a targeted mailing or news releases to the local media.

Financial Resources

- Providing resources through watershed districts, with greater technical support and research expertise available may require a doubling of Iowa's investment in environmental resources, but returns will cover the investment if the investments are effectively targeted.
- Funding to Watershed Districts could include local tax levys, EPA 319 nonpoint source program funds, and various other state and federal program grants and loans. USDA Natural Resource Conservation Service programs such as the Conservation Security Program (CSP) or the Conservation Reserve Enhancement Program (CREP) could provide landowner incentives to participate in the Beacon Watershed Program. Increased levels of technical assistance would also be required.
- Assured on-going funding is necessary for implementing an improved assessment and monitoring program.
- In some areas funding efficiency can be increased by out-sourcing monitoring and other services (creating educational opportunities and jobs) and coordinating efforts among agencies and institutions.
- Currently Iowa's TMDL program is almost entirely funded by federal funds from EPA and there is no direct state funds appropriated for this effort. To implement this plan the state must invest more state resources in the monitoring and assessment of impaired waters and in the development and implementation of watershed restoration plans. The appropriate amount of funding should be determined through a planning effort.

Social/Economic Impact

- Awareness and pride in natural resources are potential positive social impacts.
- Economic investments are likely to be returned through improved recreational opportunities, improved efficiency of agricultural production, and stimulatory effects of improved quality of life on business investment and reduced migration from Iowa.
- Societal water quality concerns are addressed proactively on an on-going basis.

Measurement of Success

- Monitoring data show improvements in water quality in restored watersheds
- Increases in public awareness of their watershed and its issues
- Documented improvements in land and water management and wider implementation of the most successful practices.
- The appropriate data needed to identify impaired waters is available in a timely fashion

- We are able to identify and rectify water quality problems in Iowa watersheds
- Sources of drinking water are of known quality and trends indicate improvement is taking place
- Iowa's list of impaired waters begins to shrink and water quality begins to improve across the state

Members of the Impaired Waters Restoration Work Group

Susan Heathcote (Chair)	Iowa Environmental Council
John Glenn	Rathbun Rural Water Alliance (IAWA)
Mark Tomer	USDA Soil Tilth Laboratory
Dean Lemke	Iowa Department of Agriculture and Land Stewardship
Tom Halbur	Iowa Farm Bureau
Jack Riessen	Iowa Department of Natural Resources
Gary Chamness	Chamness Technologies (ABI)
John Downing	Iowa State University
Keith Sexton	Iowa Corn Growers Association

Pat Boddy of Boddy Media Group served as facilitator for our work group sessions